APPENDIX G

RECCO, HDOB, AND TEMP DROP CODES, TABLES AND REGULATIONS

		1	2	3	4	5	6	7	8
NUMBER		9	G	Y DAY OF WEEK SUN-1	L_o LONGITUDE DEGREES AND TENTHS (Note 4)	h_a PRESSURE ALTITUDE OF AIRCRAFT REPORTED TO THE NEAREST DECAMETER	d WIND DIRECTION AT FLIGHT LEVEL (Tens of deg. true.)	T TEMPERATURE WHOLE °C (Note 6)	I INDICATOR
		X RECCO INDICATOR SPECIFYING TYPE OF OBSERVATION Table 1	G TIME OF OBSERVATION (Hours and Minutes) (GMT)	Q OCTANT Table 3	L_o	h_a	d	T	j INDEX TO HHH Table 9
OBSERVATION		X	g	L_a LATITUDE DEGREES AND TENTHS	L_o	h_a	f WIND SPEED AT FLIGHT LEVEL (Knots)	T_d DEW POINT WHOLE °C (Note 6)	H GEOPOTENTIAL HEIGHT/ D-VALUE OR SLP PER INDEX j
		X	g	L_a	8 TURBULENCE Table 4	d_t TYPE OF WIND Table 6	f	T_d	H
		9	I_d DEW POINT INDICATOR Table 2	L_a	f_c FLIGHT COND Table 3 (Note 5)	d_a METHOD OF OBTAINING WIND Table 7	f	w PRESENT WEATHER (Note 7 Table 8)	H (Note 8)

REMARKS

TYPE AIRCRAFT | CALL SIGN | METEOROLOGIST

	9	10	11	12	13	14	15	16
	1 INDICATOR	c CLOUD TYPE Table 11	c CLOUD TYPE Table 11	c CLOUD TYPE Table 11	1 INDICATOR	c CLOUD TYPE Table 11	c CLOUD TYPE Table 11	c CLOUD TYPE Table 11
	k_n NR OF CLOUD LAYERS (Note 9)	h_s ALTITUDE OF BASE Table 12	h_s ALTITUDE OF BASE Table 12	h_s ALTITUDE OF BASE Table 12	K_n NR OF CLOUD LAYERS (Note 9)	h_s ALTITUDE OF BASE Table 12	h_s ALTITUDE OF BASE Table 12	h_s ALTITUDE OF BASE Table 12
	N_s AMOUNT OF CLOUDS (Note 9) Table 10	h_s	h_s	h_s	N_s AMOUNT OF CLOUDS (Note 9) Table 10	h_s	h_s	h_s
	N_s	H_t ALTITUDE OF TOP Table 12	H_t ALTITUDE OF TOP Table 12	H_t ALTITUDE OF TOP Table 12	N_s	H_t ALTITUDE OF TOP Table 12	H_t ALTITUDE OF TOP Table 12	H_t ALTITUDE OF TOP Table 12
	N_s	H_t	H_t	H_t	N_s	H_t	H_t	H_t

REMARKS

RECCO RECORDING WORKSHEET

	17	18	19	20	21	22	23	24
	4 INDICATOR	6 INDICATOR (Note 11)	6 INDICATOR (Note 11)	7 INDICATOR	7 INDICATOR	8 INDICATOR	8 INDICATOR	9 INDICATOR
	d DIRECTION OF SFC WIND (Tens of deg. true)	W_s SIGNIFICANT WEATHER CHANGES Table 14	W_s SIGNIFICANT WEATHER CHANGES Table 14	I_r RATE OF ICING Table 17	h_i ALT OF BASE OF ICING STRATUM (Note 12) Table 12	d_r BEARING OF ECHO CENTER (Tens of Deg. True)	E_w ECHO WIDTH OR DIAMETER Table 19	V_i INFLIGHT VISIBILITY Table 23
	d SURFACE WIND	S_s DISTANCE OF OCCURENCE OF Ws Table 15	S_s DISTANCE OF OCCURENCE OF Ws Table 15	I_t TYPE OF ICING Table 18	h_i	d_r	E_l LENGTH OF MAJ AXIS Table 19	T_w SEA SURFACE TEMPERATURE DEGREES AND TENTHS
	f SURFACE WIND SPEED (knots) (Note 10)	w_d DISTANT WEATHER Table 16	w_d DISTANT WEATHER Table 16	S_b DISTANCE TO BEGINNING OF ICING Table15	H_i ALTITUDE OF TOP OF ICING STRATUM (Note 12) Table 12	S_r DISTANCE TO ECHO CENTER Table 21	c_e CHARACTER OF ECHO Table 22	T_w
	f	d_w BEARING OF Table 13	d_w BEARING OF Table 13	S_e DISTANCE TO ENDING OF ICING Table15	H_i	O_e ORIENTATION OF ELLIPSE Table 20	i_e INTENSITY OF ECHO Table 22	T_w

REMARKS

Figure G-1. Reconnaissance code recording form

G-2

Table G-1. Reconnaissance code tables

TABLE 1 XXX
222 Sec One Observation without radar capability
555 Sec Three (intermediate) observation with or without radar capability
777 Sec One Observation with radar capability

TABLE 2 i_d
0 No dew point capability/acft below 10,000 meters
1 No dew point capability/acft at or above 10,000 meters
2 No dew point capability/acft below 10,000 meters and flight lvl temp -50°C or colder
3 No dew point capability/acft at or above 10,000 meters and flight lvl temp -50°C or colder
4 Dew point capability/acft below 10,000 meters
5 Dew point capability/acft at or above 10,000 meters
6 Dew point capability/acft below 10,000 meters and flight lvl temp -50°C or colder
7 Dew point capability/acft at or above 10,000 meters and flight lvl temp -50°C or colder

TABLE 3 Q
0	0° -90° W	Northern
1	90° W - 180°	Northern
2	180° - 90° E	Northern
3	90° - 0° E	Northern
4	Not Used	
5	0° - 90° W	Southern
6	90° W - 180°	Southern
7	180° - 90° E	Southern
8	90° - 0° E	Southern

TABLE 4 B
0 None
1 Light turbulence
2 Moderate turbulence in clear air, infrequent
3 Moderate turbulence in clear air, frequent
4 Moderate turbulence in cloud, infrequent
5 Moderate turbulence in cloud, frequent
6 Severe Turbulence in clear air, infrequent
7 Severe Turbulence in clear air, frequent
8 Severe Turbulence in cloud, infrequent
9 Severe Turbulence in cloud, frequent

TABLE 5 f_c
0 In the clear
8 In and out of clouds
9 In clouds all the time (continuous IMC)
/ Impossible to determine due to darkness or other cause

TABLE 6 d_t
0 Spot of Wind
1 Average wind
/ No wind reported

TABLE 7 d_a
0 Winds obtained using doppler radar or inertial systems
1 Winds obtained using other navigation equipment and/or techniques
/ Navigator unable to determine or wind not compatible

TABLE 8 w
0 Clear
1 Scattered (trace to 4/8 cloud coverage)
2 Broken (5/8 to 7/8 cloud coverage)
3 Overcast/undercast
4 Fog, thick dust or haze
5 Drizzle
6 Rain (continuous or intermittent precip - from stratiform clouds)
7 Snow or rain and snow mixed
8 Shower(s) (continuous or intermittent precip - from cumuliform clouds)
9 Thunderstorm(s)
/ Unknown for any cause, including darkness

TABLE 9 j
0 Sea level pressure in whole millibars (thousands fig if any omitted)
1 Altitude 200 mb surface in geopotential decameters (thousands fig if any omitted)
2 Altitude 850 mb surface in geopotential meters (thousands fig omitted)
3 Altitude 700 mb surface in geopotential meters (thousands fig omitted)
4 Altitude 500 mb surface in geopotential decameters
5 Altitude 400 mb surface in geopotential decameters
6 Altitude 300 mb surface in geopotential decameters
7 Altitude 250 mb surface in geopotential decameters (thousands fig if any omitted)
8 D - Value in geopotential decameters; if negative 500 is added to HHH
9 Altitude 925 mb surface in geopotential meters
/ No absolute altitude available or geopotential data not within ± 30 meters/4 mb accuracy requirements

TABLE 10 N_s
0 No additional cloud layers (place holder)
1 1 okta or less, but not zero (1/8 or less sky covered)
2 2 oktas (or 2/8 of sky covered)
3 3 oktas (or 3/8 of sky covered)
4 4 oktas (or 4/8 of sky covered)
5 5 oktas (or 5/8 of sky covered)
6 6 oktas (or 6/8 of sky covered)
7 7 oktas or more but not 8 oktas
8 8 oktas or sky completely covered
9 Sky obscured (place holder)

TABLE 11 C
0 Cirrus (Ci)
1 Cirrocumulus (Cc)
2 Cirrostratus (Cs)
3 Altocumulus (Ac)
4 Altostratus (As)
5 Nimbostratus (Ns)
6 Stratocumulus (Sc)
7 Stratus (St)
8 Cumulus (Cu)
9 Cumulonimbus (Cb)
/ Cloud type unknown due to darkness or other analogous phenomena

TABLE 12 $h_s h_s H_t H_t h_i h_i H_i H_i$
00 Less than 100
01 100 ft
02 200 ft
03 300 ft
etc, etc
49 4,900 ft
50 5,000 ft
51-55 Not used
56 6,000 ft
57 7,000 ft
etc, etc
79 29,000 ft
80 30,000 ft
81 35,000 ft
82 40,000 ft
etc, etc
89 Greater than 70,000 ft
// Unknown

TABLE 13 d_w
0	No report	5 SW
1	NE	6 W
2	E	7 NW
3	SE	8 N
4	S	9 all directions

TABLE 14 W_s
0 No change
1 Marked wind shift
2 Beginning or ending or marked turbulence
3 Marked temperature change (not with altitude)
4 Precipitation begins or ends
5 Change in cloud forms
6 Fog or ice fog bank begins or ends
7 Warm front
8 Cold Front
9 Front, type not specified

TABLE 15 $S_b S_e S_s$
0 No report
1 Previous position
2 Present position
3 30 nautical miles
4 60 nautical miles
5 90 nautical miles
6 120 nautical miles
7 150 nautical miles
8 180 nautical miles
9 More than 180 nautical miles
/ Unknown (not used for S_s)

Table G-1. Reconnaissance code tables (continued)

TABLE 16 w_d

0	No report
1	Signs of a tropical cyclone
2	Ugly threatening sky
3	Duststorm or sandstorm
4	Fog or ice fog
5	Waterspout
6	Cirrostratus shield or bank
7	Altostratus or altocumulus shield or bank
8	Line of heavy cumulus
9	Cumulonimbus heads or thunderstorms

TABLE 17 I_r

7	Light
8	Moderate
9	Severe
/	Unknown or contrails

TABLE 18 I_t

0	None
1	Rime ice in clouds
2	Clear ice in clouds
3	Combination rime and clear ice in clouds
4	Rime ice in precipitation
5	Clear ice in precipitation
6	Combination rime and clear ice in precip
7	Frost (icing in clear air)
8	Nonpersistent contrails (less than 1/4 nautical miles long)
9	Persistent contrails

TABLE 19 S_r, E_w, E_l

0	0NM	5	50NM
1	10NM	6	60-80NM
2	20NM	7	80-100NM
3	30NM	8	100-150NM
4	40NM	9	Greater than 150NM
		/	Unknown

TABLE 20 O_e

0	Circular
1	NNE - SSW
2	NE - SW
3	ENE - WSW
4	E - W
5	ESE - WNW
6	SE - NW
7	SSE - NNW
8	S - N
/	Unknown

TABLE 21 c_e

1	Scattered Area
2	Solid Area
3	Scattered Line
4	Solid Line
5	Scattered, all quadrants
6	Solid, all quadrants
/	Unknown

TABLE 22 i_e

2	Weak
5	Moderate
8	Strong
/	Unknown

TABLE 23 V_i

1 Inflight visibility 0 to and including 1 nautical mile
2 Inflight visibility greater than 1 and not exceeding 3 nautical miles
3 Inflight visibility greater than 3 nautical miles

RECCO SYMBOLIC FORM

SECTION ONE (MANDATORY)

$9XXX9\ GGggi_d\ YQL_aL_aL_a\ L_oL_oL_oBf_c\ h_ah_ah_ad_td_a$

$ddfff\ TTT_dT_dw\ /jHHH$

SECTION TWO (ADDITIONAL)

$1k_nN_sN_sN_s\ Ch_sh_sH_tH_t$ .... $4ddff$

$6W_sS_sW_dd_w\ 7I_rI_tS_bS_e\ 7h_ih_iH_iH_i\ 8d_rd_rS_rO_e$

$8E_wE_ic_ei_e\ 9V_iT_wT_wT_w$

SECTION THREE (INTERMEDIATE)

$9XXX9\ GGggi_d\ YQL_aL_aL_a\ L_oL_oL_oBf_c\ h_ah_ah_ad_td_a$

$ddfff\ TTT_dT_dw\ /jHHH$

Table G-2. Reconnaissance code regulations

1. At the time of the observation the aircraft observing platform is considered to be located on the axis of a right vertical cylinder with a radius of 30 nautical miles bounded by the earth's surface and the top atmosphere. Present weather, cloud amount and type, turbulence, and other subjective elements are reported as occurring within the cylinder. Flight level winds, temperature, dew point, and geopotential values are sensed or computed and reported as occurring at the center of the observation circle. Radar echoes, significant weather changes, distant weather, and icing are phenomena that may also be observed/reported. Code groups identifying these phenomena may be reported as necessary to adequately describe met conditions observed.

2. The intermediate observation (Section Three) is reported following Section One (or Section Two if appended to Section One) in the order that it was taken.

3. Plain language remarks may be added as appropriate. These remarks follow the last encoded portion of the horizontal or vertical observation and will clearly convey the intended message. Vertical observations will not include meteorological remarks. These remarks must begin with a letter or word-e.g. "FL TEMP" vice "700 MB FL TEMP." The last report plain language remarks are mandatory, i.e., "LAST REPORT. OBS 01 thru 08 to KNHC, OBS 09 and 10 to KBIX."

4. The hundreds digit of longitude is omitted for longitudes from $100°$ to $180°$.

5. Describe conditions along the route of flight actually experienced at flight level by aircraft.

6. TT, T_dT_d. When encoding negative temperatures, 50 is added to the absolute value of the temperature with the hundreds figure, if any, being omitted. A temperature of $-52°C$ is encoded as 02, the distinction between $-52°C$ and $2°C$ being made from i_d. Missing or unknown temperatures are reported as //. When the dew point is colder than $-49.4°C$, Code T_dT_d as // and report the actual value as a plain language remark - e.g. "DEW POINT NEG $52°C$".

7. When two or more types of w co-exist, the type with the higher code figure will be reported. Code Figure 1, 2 and 3 are reported based on the total cloud amount through a given altitude, above or below the aircraft, and when other figures are inappropriate. The summation principle applies only when two or more cloud types share a given altitude.

8. When j is reported as a /, HHH is encoded as ///.

9. If the number of cloud layers reported exceeds 3, k_n in the first 1-group reports the total number of cloud layers. The second 1-group reports the additional number of layers being reported exclusive of those previously reported. In those cases where a cloud layer(s) is discernible, but a descriptive cloud picture of the observation circle is not possible, use appropriate remarks such as "Clouds Blo" or "As Blo" to indicate the presence of clouds. In such cases, coded entries are not made for group 9. The sequence in which cloud amounts are encoded depends upon type of cloud, cloud base, and vertical extent of the cloud. The cloud with the largest numerical value of cloud type code (C) is reported first, regardless of coverage, base, or vertical extent. Among clouds of the same cloud type code, sharing a common base, the cloud of greatest vertical extent is reported first. The summation principle is not used; each layer is treated as though no other clouds were present. The total amount of clouds through one altitude shared by several clouds will not exceed 8 oktas. Only use code figure 0 as a place holder when you can determine that no additional cloud layers exist. In case of undercast, overcast, etc., use code figure 9 as a placeholder.

10. Due to limitations in the ability to distinguish sea state features representative of wind speeds above 130 knots, surface wind speeds in excess of 130 knots will not be encoded. Wind speeds of 100 to 130 knots inclusive will be encoded by deleting the hundreds figure and adding 50 to dd. For wind speeds above 130 knots, dd is reported without adding 50 and ff is encoded as // with a plain language remark added, i.e., "SFC WIND ABOVE 130 KNOTS."

11. Significant weather changes which have occurred since the last observation along the track are reported for W_s.

12. When aircraft encounters icing in level flight, the height at which the icing occurred will be reported for h_ih_i. The H_iH_i will be reported as //.

HDOB messages are created automatically by IWRS. Each HDOB consists of 20 lines of HD/HA data. Each HD/HA data line is composed of 30 second averages for each parameter reported, except max wind which is a 10 second average. The highest max wind recorded during the encoding interval is used in the HDOB.

The encoding interval of the HD/HA data lines in the HDOB message is operator adjustable to 30 seconds, 1 minute or 2 minutes. A 30 second encoding interval encodes every HD/HA data line and creates an HDOB every 10 minutes. A 1 minute interval encodes every other HD/HA data line and generates an HDOB every 20 minutes. Likewise, a 2 minute interval encodes every fourth HD/HA data line and generates an HDOB every 40 minutes. Regardless of the encoding interval selected, the highest max wind value since the previous encoded HD/HA data line will be reported in the observation. Samples of each type message is shown below. Each complete message would have 20 data lines.

```
SXXX50 KNHC 040952
AF967 1017A OPAL HDOB 39 KNHC
    0942. 2643N 08846W 03036 5374 127 106 140 136 112 02680 0000000000
    0943  2641N 08847W 03036 5442 116 116 136 136 120 02612 0000000000
    0943. 2640N 08849W 03065 5521 100 087 140 140 099 02561 0000000000
    0944  2638N 08850W 03028 5591 087 059 186 160 074 02454 0000000000
    0944. 2637N 08850W 03053 5630 097 028 202 158 036 02440 0000000000
    0945  2635N 08850W 03059 5647 197 009 218 148 018 02429 0000000000
                            .
                            .
                            .
```

30 second data interval

```
SXXX50 KNHC 040952
AF967 1017A OPAL HDOB 39 KNHC
    0942  2644N 08844W 03039 5333 135 094 138 136 096 02724 0000000000
    0943  2641N 08847W 03036 5442 116 116 136 136 120 02612 0000000000
    0944  2638N 08850W 03028 5591 087 059 186 160 099 02454 0000000000
    0945  2635N 08850W 03059 5647 197 009 218 148 036 02429 0000000000
    0946  2632N 08849W 03028 5632 274 052 226 148 067 02413 0000000000
    0947  2628N 08849W 03057 5488 271 118 194 130 124 02587 0000000000
                            .
                            .
                            .
```

one minute data interval

```
SXXX50 KNHC 040952
AF967 1017A OPAL HDOB 39 KNHC
    0942  2644N 08844W 03039 5333 135 094 138 136 096 02724 0000000000
    0944  2638N 08850W 03028 5591 087 059 186 160 120 02454 0000000000
    0946  2632N 08849W 03028 5632 274 052 226 148 067 02413 0000000000
    0948  2625N 08849W 03050 5378 263 113 172 140 124 02690 0000000000
    0950  2620N 08849W 03047 5268 259 094 142 134 109 02797 0000000000
    0952  2614N 08849W 03044 5217 262 075 162 108 090 02845 0000000000
                            .
                            .
                            .
```

two minute data interval

Figure G-2. Sample HDOB messages

Table G-3. HDOB message format

HHMML$_a$L$_a$mmH L$_o$L$_o$L$_o$mmH PPPPP DDDD WWW SSS TTT ddd MMM RRRRR FFFFFFFFFF

HHMM: The time of observation in hours and minutes (UTC). A period following
                    HHMM indicates a data time of 30 seconds past the minute.

L$_a$L$_a$mmH: The latitude of the observation in degrees, minutes and hemisphere
                    (N or S).

L$_o$L$_o$L$_o$mmH: The longitude of the observation in degrees, minutes and hemisphere
                    (E or W).

PPPPP: The pressure altitude in meters.

DDDD: The absolute value of the D-value in meters (a 5 occupies the thousands
                    place if the D-value is negative. For example, -34m is encoded as 5034.

WWW: The wind direction in degrees, with 0 being true north, increasing
                    clockwise.

SSS: The wind speed in knots.

TTT: The air temperature in degrees and tenths Celsius. The tenths digit is even
                    for temperatures at or above 0°C, odd for temperatures below 0°C.

ddd: The dew point temperature, encoded the same way as air temperature.

MMM: The maximum wind speed in knots measured during the minute. This is the
                    peak wind speed averaged over a 10-sec period.

RRRRR: Radar altitude in meters

FFFFFFFFFF:Default status for the MINOB/HDOB data. A "1" indicates the parameter is
                    defaulted (suspect value) or based on a parameter that is defaulted. A "0"
                    indicates the value is not defaulted. The field indicate default for (in order):
                    latitude, longitude, pressure altitude, D-value, wind direction, wind speed,
                    air temperature, dew point, maximum wind speed, radar altimeter.

Table G-4. TEMP DROP CODE

EXTRACT FROM: WMO-No. 306 MANUAL ON CODES
FM 37-IX Ext. TEMP DROP - Upper-level pressure, temperature, humidity and wind report from a sonde released by carrier balloons or aircraft. See Figure G-3 for an example TEMP DROP message for tropical cyclone operations.

CODE FORM:

PART A

SECTION 1 $M_iM_iM_jM_j$ $YYGGI_d$ $99L_aL_aL_a$ $Q_cL_oL_oL_oL_o$ $MMMU_{La}U_{Lo}$

SECTION 2 $99P_oP_oP_o$ $T_oT_oT_{ao}D_oD_o$ $d_od_of_of_of_o$

                        $P_1P_1h_1h_1h_1$ $T_1T_1T_{a1}D_1D_1$ $d_1d_1f_1f_1f_1$

                        $P_nP_nh_nh_nh_n$ $T_nT_nT_{an}D_nD_n$ $d_nd_nf_nf_nf_n$

SECTION 3 $88P_tP_tP_t$ $T_tT_tT_{at}D_tD_t$ $d_td_tf_tf_tf_t$
                        or
                        88999

SECTION 4 $77P_mP_mP_m$ $d_md_mf_mf_mf_m$ $(4v_bv_bv_av_a)$
                        or
                        $66P_mP_mP_m$ $d_md_mf_mf_mf_m$ $(4v_bv_bv_av_a)$
                        or
                        77999

SECTION 9   51515 (through 59595) Code groups to be developed <u>regionally</u>.

SECTION 10   61616 (through 69696) Code groups to be developed <u>nationally</u>.

PART A
SECTION 1 - IDENTIFICATION AND POSITION

M_iM_i Identification letters of the report = XX

M_jM_j Identification letters of the part of the report = AA

YY   Day of the month (GMT). When wind data are included 50 is added to YY.

GG   Actual time of the observation, to the nearest whole hour (GMT).

I_d Highest mandatory level for which wind is available. 7=700 mb, 5=500 mb, etc. If flight level is above a standard surface, for example 495, report a 5 for 500 mb in the I_d group.

        Note the following clarification was approved at the 52d IHC: I_d will specify in hundreds of mb (Part A) or tens of mb (Part C) the highest mandatory isobaric level for which the wind is reported. For example, in Part A, $I_d = 7$ indicates 700 mb, but in Part C, $I_d = 7$ indicates 70 mb. $I_d = 0$ refers to the 1000 mb level. The surface wind group should always be present.

(1) The wind group shall be omitted at all levels above the level specified by I_d, except as noted in (3) and (4) below.

(2) The wind group shall be present at all levels at and below the level specified by I_d. At levels below that specified by I_d for which the wind is missing, encode the wind group as "/////."

(3) When the highest mandatory level for which the wind is reported is 250 mb, encode I_d as 2. If other information is available above 250 mb, encode the 200 mb wind group as "/////."

(4) When the highest mandatory level for which the wind is reported is 150 mb, encode I_d as 1. If other information is available above 150 mb, encode the 100 mb wind group as "/////."

(5) When no winds are reported for any level, encode I_d as "/," encode the surface wind group as "/////," and omit all wind groups above the surface.

99   Indicator for data on position follow.

$L_aL_aL_a$ Latitude, in tenths of a degree.

Q_c Quadrant of the globe. The earth is divided by the Greenwich meridian and the equator into quadrants. The code figure reported depends on the latitude and longitude of the observation position.

$L_oL_oL_oL_o$ Longitude, in tenths of a degree.

MMM   Marsden square. The number of the marsden square for aircraft position at the time of the observation is reported for MMM. Always report three digits for MMM, with zeros reported for the hundreds and tens digits when required. When an observation is within a depicted 10 degree square, report the number of that square. When on an even 10 degree latitude or longitude circle, the marsden square for MMM is obtained by moving in the direction of larger latitude and/or longitude. EXAMPLE: Assuming a position of 18.1N, 131.4W, MMM is 050; assuming a position of 30.0N, 140.0E, MMM is 130. At the equator or on the prime meridian, report the marsden square compatible with the Q_c reported.

U_{La} Units digit in the reported latitude.

U_{Lo} Units digit in the reported longitude.

SECTION 2 - SURFACE AND STANDARD ISOBARIC SURFACES

99   Indicator for data for the surface level follow.

$P_oP_oP_o$ Pressure of specified levels in whole millibars, thousands digits omitted. ($P_oP_oP_o$ is always surface level.)

P_1P_1 Pressure of standard isobaric surfaces in units of tens of millibars. (1000mbs=00,
P_nP_n 925mbs=92, 850mbs=85, 700mbs=70, etc.)

$h_1h_1h_1$ Height of the standard pressure level in geopotential meters or decameters above the surface. Encoded in meters up to but not including 500mbs. Encoded in decameters at and
$h_nh_nh_n$ above 500mbs omitting, if necessary, the thousands or tens of thousands digits. Add 500to hhh for negative 1000mb heights. Report 1000mb groups as 00/// ///// when surface pressure is less than 950mbs.

T_oT_o T_1T_1 T_nT_n	Tens and units digit of air temperature (not rounded off) in degrees Celsius, at specified levels beginning with surface.
T_{ao} T_{a1} T_{an}	Approximate tenths value and sign (plus or minus) of the air temperature. Even = plus; Odd = minus.
D_oD_o D_1D_1 D_nD_n	Dewpoint depression (with respect to water) at standard isobaric surfaces beginning with surface level. When the depression is 4.9C or less encode the units and tenths digits of the depression. Encode depressions of 5.0C through 5.4C as 50. Encode depressions of 5.5C through 5.9C as 56. Dewpoint depressions of 6.0C and above are encoded in tens and units with 50 added. Dewpoint depressions for relative humidities less than 20% are encoded as 80. When air temperature is below -40C report D_nD_n as two solidi.
d_od_o d_1d_1 d_nd_n	True direction from which wind is blowing rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.
$f_of_of_o$ $f_1f_1f_1$ $f_nf_nf_n$	Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 29<u>5</u>° at <u>1</u>25 kts encoded as 29<u>6</u>25. (Notes 1&2)

NOTE: 1. When flight level is just above a standard surface and in the operator's best meteorological judgement, the winds are representative of the winds at the standard surface, then the operator may encode the standard surface winds using the data from flight level. If the winds are not representative, then encode /////.

2. The wind group relating to the surface level ($d_od_of_of_of_o$) will be included in the report; when the corresponding wind data are not available, the group will be encoded/////.

SECTION 3 - DATA FOR TROPOPAUSE LEVELS

88	Indicator for data for tropopause level(s) follow.
$P_tP_tP_t$	Pressure at the tropopause level reported in whole millibars.
T_tT_t	Air temperature in whole degrees Celsius, at the tropopause level.
T_{at}	Approximate tenths value and sign (plus or minus) of the air temperature at the tropopause level.
D_tD_t	Dew point depression at the tropopause level.
d_td_t	True direction at the tropopause level rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.
$f_tf_tf_t$	Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 29<u>5</u>° at <u>1</u>25 kts encoded as 29<u>6</u>25.
88999	Indicator that tropopause data have not been observed.

SECTION 4 - MAXIMUM WIND DATA

66	Indicator that data for maximum wind level and for vertical wind shear follow when max wind occurs at flight level.
77	Indicator that data for maximum wind level and for vertical wind shear follow when max wind level does not coincide with flight level.

$P_mP_mP_m$ Pressure at maximum wind level in whole millibars.

d_md_m True direction from which wind is blowing at the maximum wind level rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.

$f_mf_mf_m$ Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 29<u>5</u>° at <u>1</u>25 kts encoded as 29<u>6</u>25.

4   Data for vertical wind sheer follow.

v_bv_b Absolute value of vector difference between max wind and the wind 3000 feet BELOW the level of maximum wind, reported to the nearest knot. Use "//" if missing and 4 group is reported. A vector difference of 99 knots or more is reported with the code figure "99".

v_av_a Absolute value of vector difference between max wind and the wind 3000 feet ABOVE the level of maximum wind, reported to the nearest knot. Use"//" if missing and 4 group is reported. A vector difference of 99 knots or more is reported with the code figure "99".

77999   Indicator that maximum wind data have not been observed.

SECTION 10 - NATIONAL PRACTICES

61616   Mission identifier followed by the observation number and the four-letter ICAO identifier for the station that copied and disseminated the observation (e.g., 61616 NOAA9 0403A CLAUDETTE OB 01 KWBC)

62626   Remarks (e.g., EYEWALL, SST28.2, SFC WND AT 7M)

CODE FORM:

PART B

SECTION 1 $M_iM_iM_jM_j$ YYGG/ $99L_aL_aL_a$ $Q_cL_oL_oL_o$ $MMMU_{La}U_{Lo}$

SECTION 5 $n_on_oP_oP_oP_o$ $T_oT_oT_{ao}D_oD_o$

                      $n_1n_1P_1P_1P_1$ $T_1T_1T_{a1}D_1D_1$

                      $n_nn_nP_nP_nP_n$ $T_nT_nT_{an}D_nD_n$

SECTION 6   21212 $n_on_oP_oP_oP_o$ $d_od_of_of_of_o$

                      $n_1n_1P_1P_1P_1$ $d_1d_1f_1f_1f_1$

                      $n_nn_nP_nP_nP_n$ $d_nd_nf_nf_nf_n$

SECTION 7   31313 $s_rr_ar_as_as_a$ 8GGgg

SECTION 9   51515 $101A_{df}\ A_{df}$ or

                   $101A_{df}\ A_{df}$ $0P_nP_nP'_nP'_n$.   or

                   $101A_{df}\ A_{df}$ $P_nP_nh_nh_nh_n$

SECTION 10   61616   Repeat national practice encoded in Part A.
                  62626   Repeat national practice encoded in Part A.

PART B

SECTION - 1 IDENTIFICATION AND POSITION

M_jM_j Identification letters of the part of the report = BB.

/   Filler figure for last digit of YYGG group. No wind groups reported for any of the significant isobaric surfaces.

All other groups are the same as reported in Part A - Section 1

SECTION 5 - DATA FOR SIGNIFICANT TEMPERATURE AND RELATIVE HUMIDITY LEVELS

n_on_o Number of level, starting with surface level. Only surface level will be numbered as "00."
n_1n_1 When a standard level is also selected as significant, repeat the level in section 5. Encode
n_nn_n significant levels to indicate missing data as nn/// /////.

$P_oP_oP_o$ Pressure at specified levels in whole millibars, beginning with surface.
$P_1P_1P_1$
$P_nP_nP_n$

Temperature and humidity data groups are reported in the same manner as the temperature and humidity data in Part A - Section 2.

SECTION 6 - DATA FOR SIGNIFICANT WIND LEVELS

21212   Data for significant levels with respect to wind follow. Wind data groups are reported in the same manner as the wind data in Part A - Section 2.

SECTION 7 - SOUNDING SYSTEM INDICATION

31313   Data on sounding system.

s_r Identifies solar and infrared radiation correction. Always report as zero--no correction.
$r_a r_a$ Identifies dropsonde/sounding system used. Always report as "96"--descending radiosonde.
$s_a s_a$ Identifies tracking technique/status of system used. Reported as "00" or "08."
    "0" - Aircraft system has no windfinding capability.
    "8" - Automatic satellite navigation.

8   Indicator for time of observation.
GG   Actual time of dropsonde launch to the nearest whole hour UTC.
gg   Actual time of dropsonde launch in minutes UTC.

SECTION 9 - ADDITIONAL DATA GROUPS

$101A_{df} A_{df}$ Specifications of regional additional data being reported.

0   Group indicator.
$P_n P_n$ Pressure of specified levels in tens of millibars. (1007 mb=01, 945 mb=95, 726 mb=73).
$P'_n P'_n$

$P_n P_n h_n h_n h_n$ Data reported in the same manner as in Part A - Section 2.

51515   Additional data in regional code follow.

10166   Geopotential data are doubtful between the following levels, $0P_n P_n P'_n P'_n$. This code figure is used only when geopotential data are doubtful from a level to termination of the descent. NOTE: When radar altimeter is inoperative and surface reference is used, or if the ARWO advises that geopotential platform data is doubtful, a 10166 is reported for the entire run.

10167   Temperature data are doubtful between the following levels: $0P_n P_n P'_n P'_n$. This code figure shall be reported when only temperature data are doubtful for a portion of the descent. If a 10167 group is reported a 10166 will also be reported. EXAMPLE: Temperature is doubtful from 540mbs to 510mbs. SLP is 1020mbs. The additional data groups would be: 51515 10166 00251 10167 05451.

10190   Extrapolated altitude data follows:

    1. When the sounding begins within 25mbs below a standard surface, the height of the surface is reported in the format 10190 $P_n P_n h_n h_n h_n$. The temperature group is not reported. EXAMPLE: Assume the release was made from 310mbs, and the 300mb height was 966 decameters. The last reported standard level in Part A is the 400mb level. The data for the 300mb level is reported in Part B as 10190 30966.

    2. When the sounding does not reach surface but terminates within 25mbs of a standard surface, the height of the standard surface is reported in Part A of the code in standard format and in Part B of the code in the format 10190 $P_n P_n h_n h_n h_n$. EXAMPLE: Assume termination occurred at 980mbs, and the extrapolated height of the 1000mb level was 115 meters. The 1000mb level would be reported in Part A of the code as 00115 ///// and in Part B as 10190 00115.

10191   Extrapolated surface pressure precedes. Extrapolated surface pressure is only reported when the termination occurs between 850mbs and surface. Surface pressure is reported in Part A as $99P_oP_oP_o$ ///// and in Part B as $00P_oP_oP_o$ /////. When surface pressure is extrapolated, the 10191 group is the last additional data group reported in Part B.

FIGURE G-3. EXAMPLE TEMP DROP MESSAGE FOR TROPICAL CYCLONE OPERATIONS

```
UZNT13 KWBC 141910
XXAA  64193 99272 70775 08077 99017 27657 11003 00146 26456 07505 92829 20844 03501 85557
16659 00000 70183 07260 ///// 50587 08156 23007 40757 19166 22014 30965 34964 17018 25089
45163 20234 579// 88999 77999
61616 NOAA9 0403A CLAUDETTE OB 01 KWBC
62626 EYEWALL, SST28.2, SFC WIND AT 7M

XXBB  6419/ 99272 70775 08077 00017 27657 11956 22837 22872 17650 33832 16063 44789 12444
55704 07458 66692 06867 77658 04062 88640 03070 99598 00956 11588 01363 22578 02336 33559
04327 44528 06350 55520 06961 66513 07347 77492 08759 88482 09957 99460 11759 11410 17957
22401 18966 33393 20162 44381 21569 55361 24364 66353 25570 77318 31359 88302 34564 99238
47962 11192 605//
21212 00017 11003 11435 22512 22419 20510 33397 22014 44330 16017 55292 18017 66270 16521
77192 19014
31313 09608 81833
61616 NOAA9 0403A CLAUDETTE OB 01 KWBC
62626 EYEWALL, SST28.2, SFC WIND AT 7M
NNNN
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